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DEMOGRAPHIC CHANGE, PROVINCIAL FISCAL BEHAVIOUR, AND REGIONAL ECONOMIC GROWTH

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1. Introduction

This paper is concerned with how demographic differences from province to province and region to region can affect regional rates of economic growth, both directly, by changing the skill and productivity mix of regional populations and, indirectly, by influencing the levels of regional taxes and public expenditures. These demographic differences can either be stable and longstanding - i.e. "steady-state" differences - or they can be the result of short-term changes in a given region's demographic structure. Such changes can, in turn, be either "exogenous" to the model, that is, caused by external or random events, or they can be "endogenous" to it, in which case the interplay of demography and economics can produce systematic and possibly permanent differences across regions both in their economic and demographic structures.

Endogenous demographic changes have long been thought to influence the economic fortunes of Canada's less-developed regions. A recurring theme in Maritime economic history, for instance, is that this region of Canada has suffered greatly by emigration of its most talented and entrepreneurial citizens both to other parts of Canada and to the United States (see Brookes 1976 and Matthews 1983). My conclusion in this review of the relevant

literature is that this longstanding view that the interplay of demographics and economics involves Atlantic Canada in a vicious circle may well be correct. Much more work needs to be done, however, to discover just how important such interplay is.

In thinking about possible interactions between demography and regional economic growth, (at least) six phenomena are important:

1. regional dependency ratios
2. regional variations in female participation in the labour force
3. the effects of dependency ratios on local expenditure needs, and their consequent effects on local tax rates
4. the effects of female participation rates on local market income and therefore on the locality's ability to tax itself
5. the effects of local fiscal variables on migration both into and out of the locality, and
6. the effects of migration on local economic growth and - reflexively - on local expenditure needs

In the real world, of course, these variables are likely to interact with one another in ways that can only be captured with a "general-equilibrium" simulation model. Unfortunately, a model that embodies demographic effects has not yet been applied to Canadian regional problems (though see Whalley and Trella 1986 for an "ordinary" GE model), so in this paper I can only describe how such variables might interact with one another and then summarize what has been learned about their interaction from

"partial-equilibrium" studies, that is, studies that examine only one or two of these interactions at a time. This I do in sections 2 and 3, below. One obvious lesson here, however, is the importance of building a regional "GE" model that will address such questions, and at the earliest possible date.

2. Outlines of a Model

As suggested, the full interaction of the variables I have described can only be captured in a general-equilibrium simulation model of the sort that has not yet been built for Canada. Until then, however, it is possible to develop at least some intuition about how demographic and economic factors interact to determine regional variations in a national economy which in fact consists of several fairly distinct regional economies. This section of the paper tries to do that.

To begin with, suppose the various regions of Canada were demographically identical (which is not now and probably never has been true; see below, section 3). Now suppose the demographic structure of, say, the Maritimes, were disturbed, so that dependency ratios rose in that region. For present purposes, it doesn't particularly matter whether the unusually rapid growth of population is at the bottom or top of the age distribution, so suppose, for convenience, that it's at both. The immediate effect would be an increase in the demand for schools and for medical care. While in theory these demands either could be ignored or could be financed out of reduced expenditures in other areas, in practice there is likely to be a net increase

in local expenditures following on the increase in the dependency ratio. This can be financed by increases in borrowing, in taxes, or in federal transfers. In fact, federal transfers are not very sensitive to expenditure "needs": the EPF grants are explicitly unrelated to actual expenditure on the various established programmes, while equalization payments emerge from a tax-based formula that takes no account of local need. So either taxes or borrowing must increase, and since more borrowing today means higher taxes in future, in either case taxpayers are likely to perceive an increase in their lifetime tax burden.

A second way in which local tax rates may rise in response to demographic change has to do with the labour force participation of female workers. If an increase in the proportion of children in a population causes fewer women to participate in the labour force, this means, in effect, that more women will be earning "home income" rather than market income. The total value of goods and services produced may not change - i.e., the value of home work may be more or less the same as the value of market work - but home income is harder to tax than market income. So if a given amount of money is to be raised for public purposes, tax rates will have to be higher whenever the labour force participation rate is lower. Add this to the possibility that in fact a larger amount of public money will have to be raised when the dependency ratio rises and tax rates are almost bound to increase in response to "unfavourable" demographic changes.

An increase in lifetime local taxes per worker is likely to encourage emigration from the province(s) concerned. To be sure, those burdened with

dependents may be willing to pay the tax increase in exchange for public support for their dependents. On the other hand, those who have no dependents pay extra taxes but get no benefits. Indeed, they may be the beneficiaries of public programmes that get cut in order to pay for the increased services for dependent-aged people, which makes it all the more likely that they will leave. And, of course, even those who do have dependents will find that they can get the same services for their dependents in provinces that have not experienced a growth in the dependency rate, but at these provinces' old (i.e., more favourable) tax rate.

In sum, a change in the age structure of a region's population may give rise to tax increases that encourage interregional migration.

The next link in the causal chain is that those who leave a region in response to an increase in its tax rate will not be a random sample of its population. Taxpayers obviously are more likely to leave than non-taxpayers. And so, by and large, are young people, since they stand to suffer a larger lifetime loss as a result of increased tax rates than older people do. Moreover, if increases in tax rates are progressive, higher-income people are more likely to leave than lower-income people, and those who remain may be less likely to invest in "human capital", i.e. to pursue training and education that would raise their lifetime incomes.

If, on average, those who leave are not average, then this raises the possibility of a significant "backwash" effect on regional economic growth (to use the terminology of Myrdal 1957; see also Hirschman 1958 and Gaile

1979, 1980). Moreover, it will skew the age structure of the remaining population even more toward the dependent age groups, which will bring about further increases in expenditure requirements and reductions in the income base out of which taxes are paid.

In fact, the possibility that the Maritime region of Canada has suffered from a vicious circle - in which slow growth leads to emigration, which leads to even slower growth and even more emigration - is a common theme in Canadian regionalism. There certainly are plentiful references in the literature to the harmful effects of population-stripping on Maritime society (see Matthews 1983, Brookes 1976, and Polese 1981). And if the best, brightest and youngest Maritimes do typically move to other parts of Canada, this hardly augurs well for the incomes of those who remain. The variation on this theme offered here is simply that demographic change and its implications for fiscal policy can play an important, independent role in this process.

On the other hand, migration flows between provinces are not that large in absolute terms (see Winer and Gauthier 1982b), and differences in tax rates across provinces may not be crucial in the decisions of all that many migrants. So it remains to be seen just how important the vicious-circle hypothesis is empirically. As noted, this would require more or less elaborate "general-equilibrium" simulations. In the next section of the paper, I summarize what we do know about the different causal links in this

story and suggest where more information is required.

3. What We Know

i. Regional demographies do differ

Age structures do differ across provinces (see Savoie 1986). Moreover, they have differed for some time. Green 1971 finds large differences for the late 19th century, although such differences closed somewhat toward the turn of the century. On the other hand, Shaw 1986 finds few differences in age structure across metropolitan areas in the 1970s. Thus the observed difference in age structures across provinces may have something to do with remaining differences in the rural-urban mix of provincial populations.

To be perfectly clear, not only do provincial populations differ in their age structure, but the Maritimes are characterized by higher dependency ratios than are central Canada and the far West (i.e., Alberta and British Columbia), a pattern consistent with the story told in section 3 about higher dependency ratios giving rise to higher tax rates.

Labour force participation rates in the Maritimes are also considerably - and consistently - lower in the Maritimes than in the other regions of Canada. It is not known whether this results primarily from economic or sociological considerations but it is at least possible that the higher dependency ratio in the Maritimes has something to do with encouraging

more women to stay home. What is certain, of course, is that the lower overall participation rate reduces the base of market income on which taxes can be levied and, assuming expenditure needs are given, raises local tax rates.

That age structures and participation rates should vary across regions, even in apparently permanent ways, is not especially surprising. Biehl 1980 notes significant differences in participation rates across countries, while Andorka 1968 describes persistent differences in population age structures of the regions of 20th-century Hungary, a country where geography obviously does not create such substantial barriers between regions as it does in Canada.

ii. Demographic change does affect local expenditures and taxes

This is certainly the usual assumption of those who make a living predicting future expenditure patterns. Thus the Economic Council of Canada 1980, Foot 1982, and Denton and Spencer 1983 all make their projections on the assumption that expenditure requirements for health care, education, and other programmes depend on the size of the "client" population groups for such programmes (though they come to different conclusions about how large future expenditure increases will be).

On the whole, however, the evidence that demographic changes have

greatly influenced public expenditures in the past is not overwhelming. The baby boom clearly gave rise to increased expenditures on education, while the recent aging of most western populations has caused an increase in the percentage of GNP transferred by means of public pension plans in most countries. On the other hand, in theory at least, such changes in the composition of expenditures can be accommodated without the aggregate of expenditures necessarily increasing. My own work on the growth of public expenditures in the OECD countries between 1945 and 1975 suggests that while demographic change did place upward pressure on expenditures virtually everywhere, in very few countries did it account for more than a small fraction - usually less than 10 per cent - of the growth in the share of public expenditures in GNP (see Watson 1980). (At the margin, of course, demographic change may well have had the usually posited effect. But its average effect was not large.)

This (on the whole nugatory) result is not likely to be of great interest for Canadian regionalism, however. With both economic conditions and the public mood considerably less expansive than was true in the 1950s and 1960s, it is unlikely that other expenditure programmes will be growing rapidly, so that changes in age structure that would seem to require increased expenditure are likely to loom much larger in the determination of overall tax and expenditure rates than was true formerly. In brief, there simply isn't that much slack in the system for them not to.

Thus while there is room for doubt about the influence of demographic change on taxation and public expenditures, it seems reasonable to suppose

that in the near future it will have an important effect at the margin. The assumption that as demographic structures change, so, too, will tax rates therefore seems reasonable, although further work on the connection between the two would certainly be welcome.

iii. Maritime public services are roughly equal to those elsewhere in the country; Maritime tax rates are higher

These two facts have been well documented (see, for instance, Canada 1985, Vol III, or Courchene 1984). What they imply is that, because of the lower aggregate tax base in the Maritimes and the insufficiency of federal transfers, the average Maritime taxpayer receives a bundle of public services not unlike that available elsewhere in the country, but pays higher taxes than his fellow citizens in other provinces. This obviously creates an unfavourable "fiscal residuum" which, other things equal, is likely to induce at least some emigration from the region. The same is true of other regions or provinces, most notably Quebec and Manitoba, although the problem is more severe in the Maritimes.

Note that since the "fiscal residuum" is the difference between the benefits received from government and the taxes paid to it, it does not particularly matter whether the lower tax base gives rise to national average expenditures with higher than average taxes or national average tax rates with lower than average expenditures. In either case, the Maritimes' fiscal residuum will be less than elsewhere and, assuming people respond to such

things, Maritimers will be tempted to move to other regions.

iv. Migrants do respond to interregional differences in fiscal variables

The standard statistical technique for investigating the determinants of interregional migration is to test whether flows between regions can be associated with regional differences in income, employment, mean temperature, ethnic composition, and the like. In recent years, several studies of Canadian interregional migration have attempted, in addition, to relate such migration to differences in fiscal variables across regions. Courchene 1974 found that unemployment insurance reduced migration from the Maritimes; Winer and Gauthier 1982a successfully related interregional migration to differences in unemployment insurance and federal transfer payments to the provinces; McNevin 1983 found that interprovincial differences in tax rates had the expected effects on migration; Shaw 1986 finds that fiscal variables and standard economic variables interact in a complicated way, but that fiscal variables do have independent explanatory power in migration equations; finally, Mills, Percy, and Wilson 1983 found that migrants in fact responded more to a dollar of fiscal surplus than to a dollar of market income. Thus there seems ample evidence that fiscal variables - tax rates, the generosity of unemployment insurance, federal transfers, and presumably a whole range of other fiscal variables - do have an effect on people's decision whether or not to continue to live in a region. This is not particularly surprising: Maritime parents undoubtedly worry about the quality of their children's education or the proximity of the nearest

general hospital, and if such things either become scarcer or cost more in taxes, presumably will give consideration to moving to regions where unfavourable changes in the fiscal environment have not taken place.

v. Migrants are not a random sample of the population

The overwhelming consensus in the literature on migration is that migrants are <u>not</u> typical members of a population but rather are disproportionately young, educated, and talented. The common Canadian phenomenon of return migration requires some modification in this assumption, but there is a great deal of evidence that supports it.

Perhaps the most dramatic evidence for Canada was Statistics Canada's special supplement to the 1980 Labour Force Survey, reporting on recent migrants to Alberta and British Columbia (see Statistics Canada 1982). By quite a large margin, migrants were disproportionately: young adults, labour force participants, educated, married, and - as evidenced by the speed with which they found employment upon arrival - employable. Although the drain on the other provinces of Canada was generally limited to less than 1 per cent of their 1975 population in the four years 1976-80, and although much return migration has taken place since, there can be little doubt that the economic loss to the regions left was greater than is indicated by the number of migrants.

Much the same results are found in several other studies of migration.

Green 1971 concluded that for most of the 19th century interregional migration in Canada was age- and sex-specific and generally tilted dependency ratios in the province left in an "unfavourable" direction. Brookes 1976 found that in the Maritimes after 1875 half the population under 30 migrated either within region or between regions each generation. Courchene 1974 concluded that, in more recent decades, the decision to migrate generally was taken before age 35, after which the probability of moving declined substantially. Grant and Vanderkamp 1976 found that peak rates of migration occurred at ages 20-24, though this undoubtedly reflected education-associated migration. In a study of migration to and from Newfoundland in the 1970s and earlier, Gauthier 1982 reported that return migrants to Newfoundland were to be found predominantly among older groups and that they were consistently less educated than emigrants from Newfoundland. In correcting for self-selection bias in Canadian migration studies, Robinson and Tomes 1982 found that, on average, migrants had personal characteristics that would have led to higher than average incomes in their home provinces had they not moved. Finally, Shaw 1986 finds that the probability of migrating declines with age and family size and increases with potential migrants' level of education.

Several other studies for Canada confirm that migration is not random, but generally takes the younger, the better educated, and the more entrepreneurial members of a region's population. So does Greenwood 1981 for the United States (who found that migration from regions is more common among college graduates), Bourguignon and Gallais-Hommono 1977 for France (they found that migration is generally among the young and

unmarried and reduces the marriage rate in areas left), and Drudy 1978 for England (where emigration from Norfolk raised dependency ratios in areas left). In sum, as Drudy put it:

> Any outmovement tends to be a selective process consisting mainly of the young working age-cohort, while the very young and aging members remain behind (Drudy 1978: 57-8).

In conclusion, there is ample evidence that migration is non-random and, not surprisingly, tends to select out the more "desirable" members of declining region's populations. The consequences for those who remain behind are the subject of the next section.

vi. Emigration reduces per capita growth in the region left and increases it in the region entered

In fact, this is a rather more precise version of the proposition than is really intended, which is simply that emigration may leave the economic fortunes of a region even worse off than they had been. In brief, Myrdal's 1957 hypothesis that both growth and decline are processes of cumulative causation find at least some support in the literature.

*To begin with, Gober-Mayers 1978 estimated a simultaneous-equations model of migration and income- and employment-growth for the US which indicated that "changes in age, sex, race, and education composition that resulted from interstate migration affected the rates of income growth in US states" (Gober-Mayers 1978: 1248). In brief, his conclusion was that:

> The effect of overall migration benefits upon per capita income growth appeared consistent with the view of migration as a stimulant to economic change. States that experienced rapid increases in per capita income during the period 1965 to 1970 did so, at least partly, because they had more desirable resident populations in 1970 than in 1965, and this change in population composition was the direct result of interstate migration (Gober-Mayers 1978: 1248-9).

*There is also, of course, the previously-mentioned evidence on the quality of migrants. As noted, both Shaw 1986 and Greenwood 1981 found that migrants typically are better educated than the average of those whom they leave behind, even after age is controlled for. Moreover, after estimating an econometric model of growth, Greenwood concluded explicitly that emigration from a region discouraged employment and income growth while immigration encouraged both. (Wrage 1981, on the other hand, found that immigration can retard the growth of wages by increasing local labour supply. On the other hand, its long-run effects may be beneficial since it does tend to raise local labour productivity.)

*Polese 1981 quotes Termote's results that international migration into Quebec in the period 1951-74 had a positive impact (albeit slight) on per capita income in that province.

*Gauthier 1982 found that emigrants from Newfoundland had higher incomes than those who stayed behind. Robinson and Tomes 1982 found the same, even after adjusting for self-selection bias in the econometric estimates.

*Beck and Maki 1977 concluded that an unfavourable demographic structure - and not abnormally low per worker incomes - was the most

important factor in explaining the Maritimes' lagging economic performance.

*Vanderkamp 1970 argued on simple Keynesian grounds that since migrants took aggregate demand with them they would cause a larger than proportionate drop in local economic activity even if they were not atypically productive. He concluded that for every 5 migrants 2 additional jobs would be lost in the region.

*Biehl 1980 found that even in a simultaneous-equations model the scale of public infrastructure was a useful predictor of per capita GNP in the German states. Thus demographic changes that reduce the tax base are likely to discourage public investments crucial to growth. Thus Drudy 1978 notes, for Norfolk, that:

> ...(The) local authority, affected by declining local revenues, found it necessary to curtail their commitment to the area in the form of transport, water supplies, sewage disposal, road improvements and social services in general (Drudy 1977: 58).

Usher 1977 tells a theoretical story consistent with these results.

*In a study of why firms locate where they do, Wheaton 1977 finds that local tax levels are quite important for new operations by old firms, if not as important as local levels of technical expertise (which he proxies by the proportion of engineers in the work force). Thus once skill-stripping begins in a region, it can be reinforced by declining commercial investment. Similarly, Hansen 1967 emphasizes the "external economies available to private firms in more advanced regions", as well as regional shortcomings

arising from the "lack of investment in the quality of human effort" (Hansen 1967: 129, 127).

*In more qualitative terms, Morrison 1977 argues that emigration typically leaves behind those least able to cope, that labour force quality declines, and that return migrants typically tend to be, in effect, losers:

> Prolonged and heavy outmigration...leaves behind those persons who are least able to cope with the unfavorable conditions that led others to depart in the first place. The remaining residents tend to lack the attributes and skills that would attract new employers who could offer them jobs or that would predispose them to move away as others before them did (Morrison 1977: 70).

In a similar vein, Barrett 1980 cites arguments about ethnic stagnation and a "sheep instinct" self-selected into the Maritime population, while O'Kelly 1979 provides support for the view that migrants and stayers come from separate sub-groups in the population.

These fragments clearly are not conclusive. But there is at least some reason to suppose that emigration does have the deleterious effects the Myrdal hypothesis of cumulative causation ascribes to it.

4. Conclusions and Recommendations for Research

A model of regional growth that places emphasis on the fiscal effects of demographic change and the demographic effects of interregional migration does seem to find some support in the various literatures I have reviewed. In brief, the model operates as follows:

1. Demographic differences across regions give rise to differences in tax rates.

2. Differences in tax rates give rise to interregional migration.

3. Interregional migration causes "unfavourable" demographic effects in regions people leave.

4. These "unfavourable" demographic changes reduce economic growth both directly, through reduced productivity of the labour force, and indirectly, as tax rates rise even further in order to support (proportionately) greater public expenditures from a reduced tax base.

It might be noted that although the migration story is consistent with the usual assumptions of neoclassical economics (and although I am a neoclassical economist!) much of this analysis has the flavour of less (economically) orthodox explanations of regional differences in income. In particular, it suggests that market solutions to the problem of the

interregional allocation of labour may not be all that satisfactory from a society-wide view. (Though emphasize "may".)

Two parts of this story are in especial need of further research, however. First, much more work should be done on the relationship between demographic change and public expenditure. As mentioned, the usual assumption in the forecasting business is that there is quite a close connection between the two. But my own work on the first three postwar decades concluded, on the contrary, that the overall level of public expenditures had relatively little to do with the quite significant demographic changes that took place in most OECD countries during that period. Rather, events were consistent with the view that in most countries it was simply decided to treat specific client groups - many of them admittedly demographically based - much better than they had been treated previously. Thus per client pensions, educational benefits, and health care spending rose dramatically in real terms in most countries. It would be very useful, in view of this, to examine whether similarly large demographic changes in the late 1970s and early 1980s forced increases in tax rates or reductions in the level of "non-demographic" expenditures in most Canadian jurisdictions.

A second major area for further work is, clearly, the model itself. The only way to tell whether the effects and interactions that have been described are empirically important is to specify plausible values for them and then to see what comes out of a general-equilibrium simulation model of regional growth and migration. GE-models are notoriously expensive, of course, but the model can be cut to fit the funds available, and quite useful

simulations can probably be run with relatively simple models. I note that I really don't see much use in trying to estimate an interregional model econometrically: the necessary data bases simply aren't good enough. Rather, I would construct plausible behavioural equations, simulate on the basis of these, and do lots of sensitivity analysis.

I should note, in concluding, that an exercise like this would provide information that was useful not only to demographers but also to students of Canadian regionalism. The cumulative causation hypothesis has been a favoured view in many parts of the literature and it would be very interesting to see whether plausible behavioural assumptions can generate results consistent with it. Needless to say, it would also be useful to see whether believable parameters could give results that were also consistent with observed regional growth and interregional migration.

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